Space Weather Forecast

Issued on Thursday, 07 April 2022 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor Geomagnetic Storm likely day 1 (7th) due to CME arrival.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with a few common class flares, the strongest of which occurred from a sunspot group that has rotated away from the Earth-side of the Sun. There are currently four sunspot regions on the visible side of the sun with a region in the northwest and one in the southeast fading during this period. The largest region remains in the southwest quadrant of the disc, however this has shown some signs of decay and produced no noteworthy activity. All other regions are small, simple and uni-polar.
No Earth-directed coronal mass ejections (CMEs) have occurred in the last 24 hours, although there are a number of filaments (lines of material held together on the Sun by its magnetic field) visible on the Earth-facing disc that are being monitored for any potential lift.

Solar Wind / Geomagnetic Activity: The solar wind has been at background or slightly elevated levels, with speeds between 380 and 440 km/s. The magnetic field carried by the wind was mostly weak, with its north-south component also weak. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Very Low, with relatively fewer and less complex active regions on the visible side of the sun than of late.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on the 3rd of April is expected to arrive at Earth early on day 1 (7th), leading to a slightly elevated solar wind environment around Earth, easing day 2 (8th). Otherwise mainly background solar winds are expected until day 3 (9th), with the arrival of the fast wind from a coronal hole. There is also the low chance of another glancing interaction from a further CME although this is very low confidence. Geomagnetic activity is forecast to become Unsettled to G1/Minor Storm from the CME on day 1 (7th). Quiet to Unsettled activity returning on day 2 (8th), before a further enhancement to Unsettled to Active, with a chance of G1/Minor Storms occurs on day 3 (9th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	20	40	20
Strong	G3	No	5	2	2	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	5	2
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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